

## Chapter Adm 45

## RENEWABLE ENERGY FINANCIAL INCENTIVE

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**Adm 45.01 Authority.** Section 16.957 (5), Stats., requires the department to establish performance standards for renewable energy systems.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.02 Purpose.** The purpose of this chapter is to establish the criteria the department will use to approve renewable energy systems and applications for a renewable energy system financial incentive. This chapter is not a health and safety code but does not relieve the applicant from complying with other applicable statutes or administrative code provisions.

Note: All renewable energy systems may be subject to applicable portions of other Wisconsin administrative codes (i.e., chs. ILHR 50-64 — building and heating, ventilating and air conditioning code; chs. Ind 20-25 — uniform dwelling code; ch. ILHR 82 — design, construction, inspection, supervision and installation of plumbing; ch. ILHR 16 Wisconsin Electrical Code; ch. Ind 17 — Solar Energy Code; chs. Ind 41-42, Boiler and Pressure Vessel Code; and related codes) and National Codes (i.e., Recommended Requirements to Code Officials for Solar Heating, Cooling and Hot Water Systems; and other related codes.)

Note: Chapter Ind 17 is currently being developed.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.03 Definitions.** (1) "Conventional fuel" means fossil, utility supplied, and wood fuels or energy derived from the above fuels.

(2) "Department" means the department of administration.

(3) "Heat pump" means a mechanical, chemical or electrical system designed to utilize the heat extracted at a low temperature and the heat rejected at a higher temperature for cooling or heating functions.

(4) "Load" means the energy requirements of a building, device or process.

(5) "Photovoltaics" means a solar energy system that converts radiant solar energy directly into electrical energy.

(6) "Renewable energy system" means a solar energy system, or a wind energy system, not including any equipment which would be present as part of a conventional energy system.

(7) "Solar energy system" means the equipment, which directly converts and then transfers or stores solar energy into usable forms of energy. Such systems may include space heating or cooling, crop drying, electricity generation or hot-water heating.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.04 Application.** Application for refund shall be made on forms provided by the department. The application may be rejected by the department if all the information requested is not provided. The depart-

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ment may request additional information in order to verify eligibility for approval. The information required by the application shall include:

Note: Application forms may be obtained by writing:

Department of Administration  
Division of State Energy  
Renewable Refund Program  
101 South Webster Street  
P.O. Box 7863  
Madison, WI 53707

The following forms are available:

AD-EN-115 - Active Solar Energy System Incorporating a Manufactured Flat-Plate, Concentrating, or Tracking Collector.

AD-EN-116 - Active Solar Energy System Incorporating a Homebuilt or Custom-Built Collector.

AD-EN-117 - Passive Solar Energy System Incorporating Direct-Gain.

AD-EN-118 - Wind Energy System or Photovoltaic Solar Energy System.

(1) Specific information including type of the conventional fuel; family size to determine the load; age and square footage of building; size of thermal storage unit; manufacturer and model of the collector; square footage of panels installed and other relevant information as indicated on the application form for the particular system being installed. Where necessary, the department may require a schematic or architect's blueprint.

(2) Cost information such as receipts or other items verifying the cost for the design, construction, equipment, and installation of the system.

(3) A photograph of the renewable energy system shall be submitted with the application.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.05 Approval criteria.** Approval for systems shall be granted provided the applicant and the system comply with all the provisions of this chapter and applicable statutes and:

(1) The durability of the solar energy system, the wind energy system and the photovoltaics solar energy system shall be documented.

(a) The durability of manufactured solar collectors shall be demonstrated by a five-year warranty, or by Solar Rating and Certification Corporation test methods ISCC Documents 80-1, 80-2, 82-3, 82-4 or equivalent testing by an accredited laboratory.

(b) The durability of nonmanufactured solar collectors, heat exchangers and storage units shall be determined by the department based upon diagrams and materials information submitted by the applicant.

(c) The materials, workmanship and corrosion resistance for manufactured heat exchangers and storage units shall be proven to be durable and reliable for a minimum of one year of service use. This requirement may be met with a one-year manufacturer's written warranty.

(d) The wind energy system components shall be proven durable for a minimum of 5 years of service use. This requirement may be met with a five-year manufacturer's written warranty.

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(e) The photovoltaics solar energy components must be proven durable for a minimum of 5 years of service. This requirement may be met with a five-year manufacturer's written warranty.

(2) The energy performance of the solar energy systems shall be documented.

(a) For manufactured collectors, the requirements for estimating average energy supplied per square foot of collector shall be the thermal performance, time constant, and angle incidence modifier tests specified in the American Society of Heating, Refrigeration and Air Conditioning Engineers, standards ASHRAE 93-77 or ASHRAE 95-1981.

(b) For nonmanufactured collectors, an estimate of the usable energy output of the system shall be submitted.

(c) The estimated energy output of the wind energy system shall be submitted based upon power curves provided by the manufacturer. The efficiency of the AC-DC conversion or storage efficiency will not be included in these calculations.

(d) The estimated photovoltaics solar energy system output will be determined by engineering specifications provided by the manufacturer. Neither conversion nor storage efficiency will be included in these calculations.

Note: These standards can be obtained by writing to:

American Society of Heating, Refrigeration and Air Conditioning Engineers, ASHRAE Publications Sales Department, 1791 Tullie Circle, N.E., Atlanta, GA 30329; *Methods of Testing to Determine the Thermal Performance of Solar Collectors*, ASHRAE 93-77; *Methods of Testing to Determine the Thermal Performance of Solar Domestic Water Heating Systems*, ASHRAE 95-1981.

Solar Rating and Certification Corporation, 1001 Connecticut Avenue, N.W., Suite 800, Washington, DC 20036; *Test Methods and Minimum Standards for Certifying Solar Collectors*, ISCC Document 80-1; *Operating Guidelines for Certifying Solar Collectors*, ISCC Document 80-2; *Test Methods and Minimum Standards for Certifying Solar Water Heating Systems*, Document ISCC 82-3; *Program Operating Guidelines for Certifying Solar Water Heating Systems*, Document ISCC 82-4.

These standards referred to above are also on file in the department of administration, the office of the secretary of state and the office of the revisor of statutes.

(3) The system produces present value savings which exceed its initial cost within a 15-year period, but not sooner than 4 years. In order to be certified the present value cost savings over a 15-year period shall equal or exceed the net cost of the system. First year energy cost savings shall be determined by the department based on information supplied by the applicant.

(a) If present value savings are greater than or equal to the net system cost, then the system will be approved for a refund. If present value savings are less than the net system cost, the system will be ineligible for a refund. The net system cost is calculated by subtracting the federal tax credit, state financial incentives and grants from the total system cost.

(b) "Discount rate" means the estimated rate of return on the best alternative investment.

(c) "Fuel inflation rate" means the estimated annual percentage increase in the cost of fuel, and includes the general economic inflation rate.

(d) "Inflation discount factor" or "IDF" means a factor which combines the fuel inflation and discount rates for the specified number of years into a single number. The IDF's for fossil, electricity, and other are 20.43, 17.48 and 17.48, respectively. The fuel inflation rate and discount rate will be reviewed by the department on an annual basis.

$$\text{IDF} = \frac{1 + I}{D - I} \times 1 - \frac{1 + I}{1 + D} \quad 15$$

I = Fuel inflation rate (fossil, 10%; Electricity, 8%; Other, 8%)

D = Discount rate (6%)

(e) "Present value savings" means the first year cost savings multiplied by the inflation discount factor (IDF):

(4) The system and the included costs shall be in compliance with the following:

(a) *Active solar energy systems—eligible system costs:* Active solar energy systems use equipment to collect, store, and distribute solar thermal energy. All solar related components not part of a conventional fuel backup system are eligible for benefits including solar collectors, duct work, piping, fans, pumps, controls, heat exchangers and thermal storage devices such as rock bins, water tanks and eutectic salt storage. In a domestic water heating system with 2 storage tanks, where one is used for storage of solar heated water and the other is an auxiliary heating tank, only the solar heated water storage tank is eligible. Where the conventional hot water tank has been removed and replaced with a single tank capable of storing solar heated water and equipped with an auxiliary heating coil, the entire tank is eligible. Eligible system costs which are not necessary system components and for which no energy savings have been claimed may be excluded from the system cost with approval by the department.

(b) *Active solar energy systems—ineligible systems costs.* The costs of the following components are ineligible system costs for active solar energy systems:

1. Humidifiers.
2. Evaporative coolers.
3. Furnaces and wood burners.
4. Water softener units.
5. Heat pumps.
6. Heat recovery systems.

(c) *Passive solar energy systems—eligible system costs.* Passive solar systems involve the use of south facing glazing, glass or transparent plastic, as a solar collector, thermal mass such as concrete, masonry or water walls for heat storage, and movable insulation. Eligible system costs which are not necessary system components and for which no energy savings have been claimed may be excluded from the system cost with approval by the department.

1. All building elements and components directly used to capture and store solar energy comprise eligible system costs. This includes only thermal storage mass, which is illuminated by the sun, such as concrete, masonry, water or phase change material; qualifying south facing glazing including frames and mullions; movable insulation used to cover glazing during the night; any exceptional structure needed as a result of inclusion of passive elements; any fans, blowers, ducts, pumps, piping and controls used to provide positive distribution of heat as well as any storage facility in addition to or in place of illuminated mass and any insulation associated with the storage. The amount of high density storage mass which is needed to store the heat collected is the amount which will be considered eligible for benefits. Positive distribution of heat does not include openings such as patio doors, for movement of heated air to conditioned space. Convective loops which demonstrate the capacity to move air effectively will be considered on an individual case basis. Only those portions of the heat distribution system that are provided solely due to the use of a passive system are eligible for refund.

2. To be considered a direct gain passive solar system the glazed areas must be provided with sufficient night insulation to cause the glazing area to have a positive net energy contribution over the heating season to the building. In addition the applicant must show that the additional cost of the glazing plus the cost of the window insulation has a payback that falls within the statutory limitations, 4 to 15 years (see s.16.957 (5), stats.). On existing structures, only the cost of glazing that adds to the existing south facing glazing will be allowed.

(d) *Passive solar energy systems—ineligible system costs.* The costs of the following components are ineligible system costs for passive solar energy systems:

1. In general, ordinary structural components of buildings or additions will not be allowed as cost items. This includes such things as framing, exterior and interior finish, envelope insulation, floor coverings, awnings, eaves, and wing walls.

2. The costs of thermal mass not within the insulated envelope of the building are not eligible. Swimming pools do not qualify as thermal mass even when the pool is indoors.

3. The costs of room furnishings such as uninsulated curtains or drapes are not eligible for benefits.

(e) *Wind energy systems—eligible system costs.* A wind energy system is a device that uses blades rotated by the wind to convert the kinetic energy of the wind into electrical or mechanical energy. All wind energy related system components are eligible for benefits up to the point where the wind system connects with a conventional system. This includes the blade assembly; tower; energy storage devices, such as batteries, generators, turbines, wiring, pumps, controls; AC inverter; synchronous inverter; fuse box; DC breakers and battery chargers; interface equipment required by the utility to make the interconnection possible.

(f) *Wind energy systems—ineligible system costs:* Sailboats, iceboats, and other wind powered vehicles or devices are not eligible for benefits.

(g) *Photovoltaics solar energy systems—eligible system costs:* All components of photovoltaics solar energy systems including generation equip-

ment, AC inverter, energy storage devices and any interface equipment required by the utility to make the interconnection possible are eligible.

(h) *Photovoltaics solar energy systems—ineligible system costs*: No additional costs beyond the system components are ineligible.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.06 Limitations.** The following limitations apply to renewable energy systems:

- (1) **NUMBER OF CLAIMS.** Only one claim may be made per system.
- (2) **SUBSEQUENT OWNERS.** Subsequent owners may not claim benefits for a system addition.
- (3) **ELIGIBLE COSTS.** Except as provided in sub. (4), the costs of the design, construction, equipment and installation of the renewable energy resource system are eligible, not to exceed \$7,500 per individual and \$100,000 for corporations or cooperatives. An applicant may not include costs of design and labor by himself or herself or dependents. Dealers and installers may include only the actual out of pocket cost of systems installed on their own property.
- (4) **GRANT MONIES.** System costs that are paid for by a federal, state or local grant are not eligible system costs. Allowable system costs, in excess of the grant, but not exceeding the maximum eligible system cost may be used as the basis upon which to calculate the amount of the refund. In this subsection, "grant" does not include any federal tax credit.
- (5) Health and safety code violations involving combustibility of materials and potability of water relating to solar installations may be grounds for withholding a refund until proof of compliance is provided by the applicant.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.07 Appeals.** Appeal of denial of a refund shall be made to the department in writing within 60 days after the date of the determination and shall state specifically why the original decision should be overruled. A decision shall be made on the appeal by the director of the bureau of policy and planning within 20 working days after the department has received all the information needed to decide the appeal.

Note: Appeals shall be sent to:

Department of Administration  
Division of State Energy  
Bureau of Policy and Planning  
101 South Webster Street  
P.O. Box 7868  
Madison, WI 53707

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.

**Adm 45.08 Transition.** Applications for refunds filed before April 15, 1984 for systems completely installed prior to January 1, 1984 shall be determined based on the statutes and rules in effect prior to January 1, 1984.

History: Cr. Register, January, 1984, No. 337, eff. 2-1-84.